## REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the interview held September 20, 2002, in the above-identified application. During the interview, Applicants' attorney discussed the various issues raised in the Final Office Action. The discussion is summarized and expanded upon below.

As claimed in Claim 1, the present invention is an aqueous polymer dispersion having a minimum film-forming temperature of below +65°C comprising at least one film-forming polymer in the form of dispersed polymer particles comprising a polymer phase P1 and a different polymer phase P2, the polymer dispersion obtained by free-radical aqueous emulsion polymerization comprising the following steps: i) polymerization of a first monomer charge M1 to give a polymer P1 having a theoretical glass transition temperature $T_g^{(1)}$ (according to Fox) and ii) polymerization of a second monomer charge M2 to give a polymer P2 having a theoretical glass transition temperature $T_g^{(2)}$ (according to Fox) which is at least 10 kelvins above $T_g^{(1)}$ in the aqueous dispersion of the polymer P1, at least one **chain transfer reagent** being used **either** in the polymerization of the monomer charge M1 **or** in the polymerization of the monomer charge M2 (emphasis added).

The rejection of Claims 1-12 under 35 U.S.C. §102(b) as anticipated by U.S. 5,643,993 (Guerin), is respectfully traversed. Guerin discloses aqueous polymer dispersions containing a structured particle consisting of a core of a first polymer and a shell of a second polymer (paragraph bridging columns 4 and 5). While, as the Examiner points out, Guerin discloses that polymerization to form their respective polymers may be carried out in the presence of at least one chain transfer reagent (column 6, lines 21-24), Guerin neither discloses nor suggests the use of at least one chain transfer reagent for making one, and only one, of the respective polymers. Indeed, as disclosed in all of the examples therein, a chain

transfer reagent (N-dodecanethiol) is used for making each of the first and second polymers (column 10, lines 1-45).

The advantage of employing a chain transfer reagent in the preparation of one, as opposed to both, polymers is demonstrated in the specification herein. Comparative Example 1 demonstrates Dispersion c-1, which was made without the use of a chain transfer reagent for either of the polymers. On the other hand, Examples 1-8 are according to the presently-claimed invention. See Table 1 at page 21 of the specification. The comparative example and examples were formulated into paints and tested for various properties, as described in the specification beginning at page 22 through page 25, line 10. The results are shown in Table 2 at page 25 of the specification. Applicants describe the results in the specification at page 25, last four lines, as follows:

> From the examples it is evident that the polymer dispersions 1 to 8 of the invention result in paints having improved scrub resistance and enhanced gloss, while the blocking resistance and viscosity of the paints remain largely unaffected.

The above-discussed results could not have been predicted from Guerin.

In the Office Action, the Examiner finds that Guerin discloses the use of "**at least**" (emphasis by the Examiner) one chain transfer agent (column 6, lines 21-24), from which the Examiner infers that Guerin discloses an embodiment wherein a chain transfer agent is used in the production of one and only one of the first polymer and second polymer. In reply, Applicants respectfully submit that a person skilled in the art would interpret the disclosure in Guerin that his process can be carried out in the presence of at least one chain transfer agent as suggesting either using at least one chain transfer agent for both of the polymerizations, or none of the polymerizations. There is simply no objective disclosed in Guerin which would be furthered by using a chain transfer agent for only one of the polymerizations.

As stated in *In re Arkley*, 172 USPQ 524, 526 (CCPA 1972):

> [R]ejections under 35 U.S.C. 102 are proper only when the claimed subject matter is identically disclosed or described in "the prior art." Thus, for the instant rejection under 35 U.S.C. [102(b)] to have been proper, the . . . reference must clearly and unequivocally disclose the claimed [subject matter] or direct those skilled in the art to the [subject matter] without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference. Such picking and choosing may be entirely proper in the making of a 103, obviousness rejection, where the applicant must be afforded an opportunity to rebut with objective evidence any inference of obviousness which may arise from the similarity of the subject matter which he claims to the prior art, but it has no place in the making of a 102, anticipation rejection.

At best, Guerin is available under § 103 only. In such a case, the comparative data of record must be considered. This data is shown in Table 2 at page 25 of the specification, a copy of which is reproduced below (without the footnotes):

| Dispersion | Scrub resistance [µm] | | Gloss | | Block resistance | | | | Viscosity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | @20° | @60° | B1 | B2 | B3 | B4 | LS | HS |
| C1 | 830 | 39 | 60 | 85 | 8 | 8 | 8 | 7 | 86 | 1.6 |
| 1 | 880 | 37 | 69 | 88 | 8 | 8 | 7 | 7 | 88 | 1.6 |
| 2 | 1050 | 36 | 69 | 88 | 8 | 8 | 7 | 7 | 87 | 1.6 |
| 3 | 935 | 38 | 71 | 89 | 8 | 8 | 7 | 7 | 88 | 1.7 |
| 4 | 970 | 36 | 70 | 88 | 8 | 8 | 4 | 7 | 85 | 1.6 |
| 5 | 1360 | 37 | 64 | 87 | 8 | 8 | 7 | 7 | 88 | 1.6 |
| 6 | 1340 | 39 | 68 | 87 | 8 | 8 | 8 | 7 | 88 | 1.6 |
| 7 | 1180 | 38 | 67 | 86 | 7 | 8 | 3 | 3 | 88 | 1.6 |
| 8 | 1600 | 37 | 70 | 90 | 8 | 8 | 2 | 4 | 84 | 1.5 |

Clearly, the prior art has recognized no nexus between the presence or absence of a chain transfer agent, and the properties of scrub resistance and gloss, while blocking resistance and viscosity remain largely unaffected.

In the Advisory Action of August 27, 2002, the Examiner finds that Dispersion C1 and Dispersion 1 "have yielded almost [the] same results." In reply, Table 2, reproduced above, shows that both scrub resistance and gloss of a coating can be improved by using Dispersion 1 as a binder instead of Dispersion C1. When taking the smaller dry film thickness of the coating obtained from Dispersion 1 into account, the increase in scrub resistance is greater than 10%. Moreover, the gloss at an observation angle of 20° is similar to the gloss obtained for the other coatings according to the invention, but markedly greater than for a coating obtained from Dispersion C1. Regarding the above-discussed scrub resistance increase of greater than 10%, the values in Table 2 must be corrected for dry film thickness. It is evident that the thicker the film is, the higher is the scrub resistance. As shown, the film of Dispersion C1 has a thickness of 39 µm and a scrub resistance of 830 cycles, while the film of Dispersion 1 has a thickness of 37 µm and a scrub resistance of 880 cycles. Therefore, the increase is not only 6% as indicated by the integers 830 and 880, but exceeds 10% when taking the film thickness into account.

In the Advisory Action of August 27, 2002, the Examiner also finds that the polymers of the claimed dispersions without a chain transfer reagent and those of Guerin with a chain transfer reagent "would be [the] same." In reply, compounds having different properties are not the same compounds. It can be seen from the data in Table 2 that the chain transfer reagent affects the properties of the coatings, which stem from the properties of the polymeric binder. It can also be seen that the properties of the coatings depend on whether the chain

transfer reagent is employed in the first or in the second step. Compare Examples 1-4 with Examples 5-8.

In addition to the comparative data in the specification, the newly submitted Zhao Declaration provides further evidence of patentability. The Zhao Declaration clearly shows that the use of the chain transfer reagent in either the first or the second polymerization steps (but not in both) yields polymers having superior application properties compared to polymers wherein the chain transfer reagent is used in both polymerization steps or in neither polymerization steps. As the Table at page 4 of the Zhao Declaration shows, polymer latex V1 (erroneously labeled as VD1 in the Table) was obtained without using any chain transfer reagent; polymer latices V2 and V3 were obtained using a chain transfer reagent for both polymerizations. Zhao concludes in the paragraph bridging pages 5 and 6 as follows:

> As can be seen from the comparative results of the latices (D1 and D2, according to the present invention, versus V1), the use of a chain transfer agent in the 1st polymerisation stage results in paints which show increased gloss and have only slightly reduced block resistance. As can be seen from the comparative results of the three pairs of latices (D1, according to the present invention, versus V2, D2, according to the present invention, versus V3 and D3, according to the present invention versus V2), the use of a chain transfer agent in both stages at total levels equal to that used in the first stage (or in the second stage) result in detrimental effects on gloss. The use of a chain transfer agent in the 2nd polymerisation stage results in polymer latices showing reduced gloss compared to latices wherein the chain transfer agent is used in the 1st polymerisation stage (D1 versus D3). However, when the chain transfer agent is used in the 2nd polymerisation stage, the scrub resistance is higher than either the case where no chain transfer agent is used (V1) or the case where the chain transfer agent is used in both stages (D3 versus V2 or V3). The higher scrub resistance associated with the use of a chain transfer agent in the 2nd stage can also be clearly seen from table 2 on page 25 of Ser. No. 09/702,724 [i.e., the present application]. Therefore the use of a chain transfer agent in either the 1st stage or the 2nd stage of the emulsion polymerisation, leads to better properties compared to those latices obtained by emulsion polymerisations without any chain transfer agent or with the chain transfer agent distributed in both stages.

New Claims 19-29 are separately patentable. These claims require that the weight ratio of the monomers present in the monomer charge M1 to the monomers present in the monomer charge M2 be, in effect, at least 2:1, i.e., polymer phase P1 is present in an amount of at least 67% of the total amount. In Guerin, on the other hand, the first or core polymer is present in a maximum amount of 65% of the total (column 5, lines 56-59).

For all the above reasons, it is respectfully requested that the rejection over Guerin be withdrawn.

The rejection of Claims 13-18 under 35 U.S.C. §103(a) as unpatentable over Guerin in view of U.S. 5,804,676 (Hieda et al) is respectfully traversed. The disclosure and deficiencies of Guerin have been discussed above. Hieda et al do not remedy these deficiencies. Hieda et al is based on a finding that most of a volatile content can efficiently be removed from a polymer composition by continuously feeding, to a polymerization reactor, a material solution comprising a specific amount of methanol as a solvent, methyl methacrylate alone or a monomer component comprising methyl methacrylate and an alkyl acrylate, a chain transfer agent and a polymerization initiator to carry out polymerization, continuously drawing a part of a polymerizate, heating it, and then feeding it onto a screw of an extruder through a feed opening substantially maintained at atmospheric pressure. In addition, it has also been found that a high-quality polymer which is usable as a molding material can be prepared without troubles such as coloring, while a high productivity is stably kept by removing the remaining volatile content from the polymer composition at a downstream vent, and then extruding the same (column 3, lines 43-58). Hieda et al disclose the formation of a polymer having a weight average molecular weight in the range of 80,000 to 200,000 (column 6, lines 20-23). The Examiner particularly relies on the disclosure in

Hieda et al that if the concentration of the chain transfer agent is too high, the weight average molecular weight of the product is less than 80,000 (column 9, lines 44-47).

This disclosure in Hieda et al simply reflects the common knowledge of what a chain transfer agent does. But no motivation is provided by Hieda et al to produce Guerin's product such that one of Guerin's polymers has a weight average molecular weight above 80,000, and another has a weight average molecular weight below 80,000. Nor does Hieda et al disclose or suggest producing one of the polymers in the presence of a chain transfer agent, and the other polymer in the absence of a chain transfer agent.

For all the above reasons, it is respectfully requested that the rejection over Guerin in view of Hieda et al be withdrawn.

The provisional rejection of Claims 1-2, 4-7, and 11-12 under the judicially created doctrine of obviousness-type double patenting over Claims 1-3 and 9 of copending Application No. 09/743,219 (the copending application), is respectfully traversed. While the Examiner purports to demonstrate similarities between the claims in the present application and in the copending application, the presently-claimed invention is not obvious over the claims of the copending application, because the claims of the copending application disclose and suggest nothing with regard to the use of at least one chain transfer reagent in the polymerization of only one of the monomer charges.

In the Final Office Action, the Examiner points to the limitation in Claim 1 of the copending application that "the polymerization conversion $U^{l}$ of the monomers Mi to be polymerized in the respective polymerization stage at no point exceeds 50 mol%" (emphasis by the Examiner), and then finds that it is commonly known in the art that monomers do not stop polymerization until a chain transfer reagent is added. The Examiner further points to the use of the term "comprising" in the claim.

In reply, the Examiner has misconstrued the meaning of the above-quoted term. As described in the specification at page 11, prenumbered lines 4-23 of the copending application, polymerization is not stopped; rather, it is interrupted after each successive addition of further polymers (i). Clearly, in the embodiment wherein all of polymer (i) is added at once, no interruption occurs. At any rate, there is no limitation in Claim 1 of the copending application that the formation of polymers (i) is not carried out to its natural completion. Nor does the use of the term "comprising" in the copending application claim render the presently-claimed invention obvious.

Accordingly, it is respectfully requested that this rejection be withdrawn.

Regarding the requirement at the first full paragraph of page 3 of the Final Office Action, the invention claimed in the copending application was made before the presently-claimed invention. Both inventions were commonly owned at the time the presently-claimed invention was made.

The rejection of Claims 1-12 under 35 U.S.C. §112, second paragraph, in the recital of the term "according to Fox", is respectfully traversed. According to Fox, the glass transition temperature of **copolymers** is calculated based on the glass transition temperature of homopolymers made from the respective **monomers** of a single polymer, as is well known and as disclosed in the paragraph bridging pages 3 and 4 of the specification. It is not, as the Examiner finds, calculated based on the overall glass transition temperature of two different **polymers**. While Applicants appreciate the Examiner's suggestion of amendment, it is respectfully submitted that this suggestion would result in a change in meaning of the claims. Applicants respectfully submit that the present meaning is clear, and no further amendment is necessary.

In the Final Office Action, the Examiner finds that the "Fox equation is not a tool to measure the glass transition temperature of a homopolymer" (emphasis by the Examiner). Applicants agree. It appears that the Examiner is interpreting the term "monomer charge" in the present claims to mean a single monomer. However, it is clear from the specification as a whole and, for example, Claim 7, that the term "charge" is synonymous with --composition-- in the present application.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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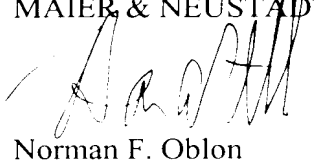

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HEREWITH

IN THE CLAIMS

--1. (Twice amended) An aqueous polymer dispersion having a minimum film-forming temperature of below +65°C comprising at least one film-forming polymer in the form of dispersed polymer particles comprising a polymer phase P1 and a different polymer phase P2, the polymer dispersion obtained by free-radical aqueous emulsion polymerization comprising the following steps:

i) polymerization of a first monomer charge M1 to give a polymer phase P1 having a theoretical glass transition temperature $T_g^{(1)}$ (according to Fox) and

ii) polymerization of a second monomer charge M2 to give a polymer phase P2 having a theoretical glass transition temperature $T_g^{(2)}$ (according to Fox) which is [different from] at least 10 kelvins above $T_g^{(1)}$ in the aqueous dispersion of the polymer phase P1,

at least one chain transfer reagent being used either in the polymerization of the monomer charge M1 or in the polymerization of the monomer charge M2.

2. (Canceled)

3. (Canceled)

10. (Amended) A process for preparing an aqueous polymer dispersion as defined in claim 1 by free-radical aqueous emulsion polymerization comprising the following steps:

i) polymerization of a first monomer charge M1 to give a polymer phase P1 having a theoretical glass transition temperature $T_g^{(1)}$ (according to Fox) and

ii) polymerization of a second monomer charge M2 to give a polymer phase P2 having a theoretical glass transition temperature $T_g^{(2)}$ (according to Fox) which is [different from] at least 10 kelvins above $T_g^{(1)}$ in the aqueous dispersion of the polymer phase P1, at least one chain transfer reagent being used either in the polymerization of the monomer charge M1 or in the polymerization of the monomer charge M2.

13. (Amended) An aqueous polymer dispersion as claimed in claim 1, wherein the polymer phase obtained in the presence of the chain transfer agent has a weight-average molecular weight in the range from 20,000 to 200,000, determined by GPC.

14. (Amended) An aqueous polymer dispersion as claimed in claim 13, wherein the polymer phase obtained in the presence of the chain transfer agent has a weight-average molecular weight in the range from 30,000 to 100,000, determined by GPC.

15. (Amended) An aqueous polymer dispersion as claimed in claim 1, wherein the polymer phase obtained in the absence of the chain transfer reagent has a weight-average molecular weight of above 800,000, determined by GPC.

16. (Amended) An aqueous polymer dispersion as claimed in claim 15, wherein the polymer phase obtained in the absence of the chain transfer reagent has a weight-average molecular weight of above 1,000,000, determined by GPC.

17. (Amended) An aqueous polymer dispersion as claimed in claim 13, wherein the polymer phase obtained in the absence of the chain transfer reagent has a weight-average molecular weight of above 800,000, determined by GPC.

18. (Amended) An aqueous polymer dispersion as claimed in claim 14, wherein the polymer phase obtained in the absence of the chain transfer reagent has a weight-average molecular weight of above 1,000,000, determined by GPC.

Claims 19-29 (New)--